

designing musical games :: gaming musical design



Rob Hamilton & Chris Platz

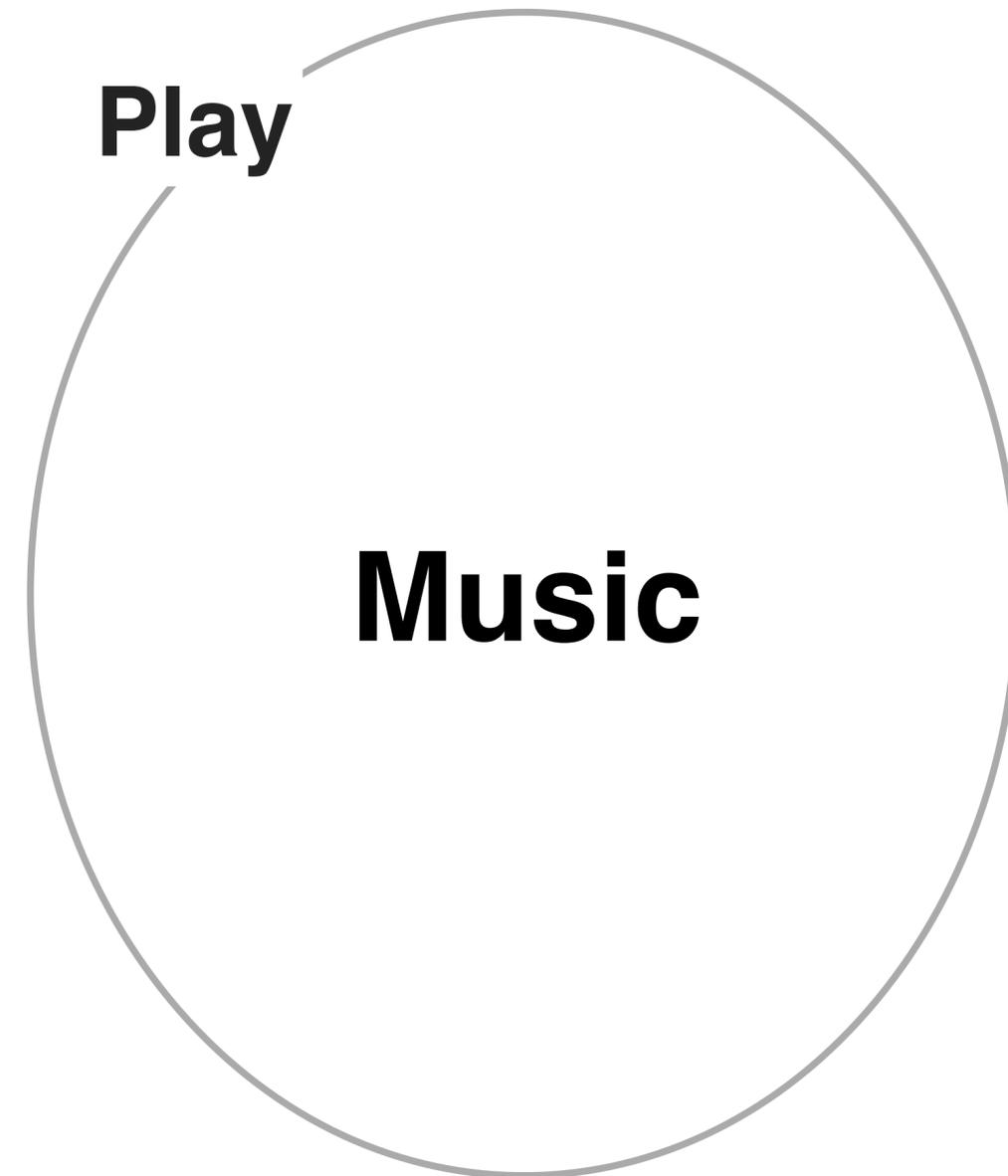
CCRMA Summer Workshop
July 20-24, 2015

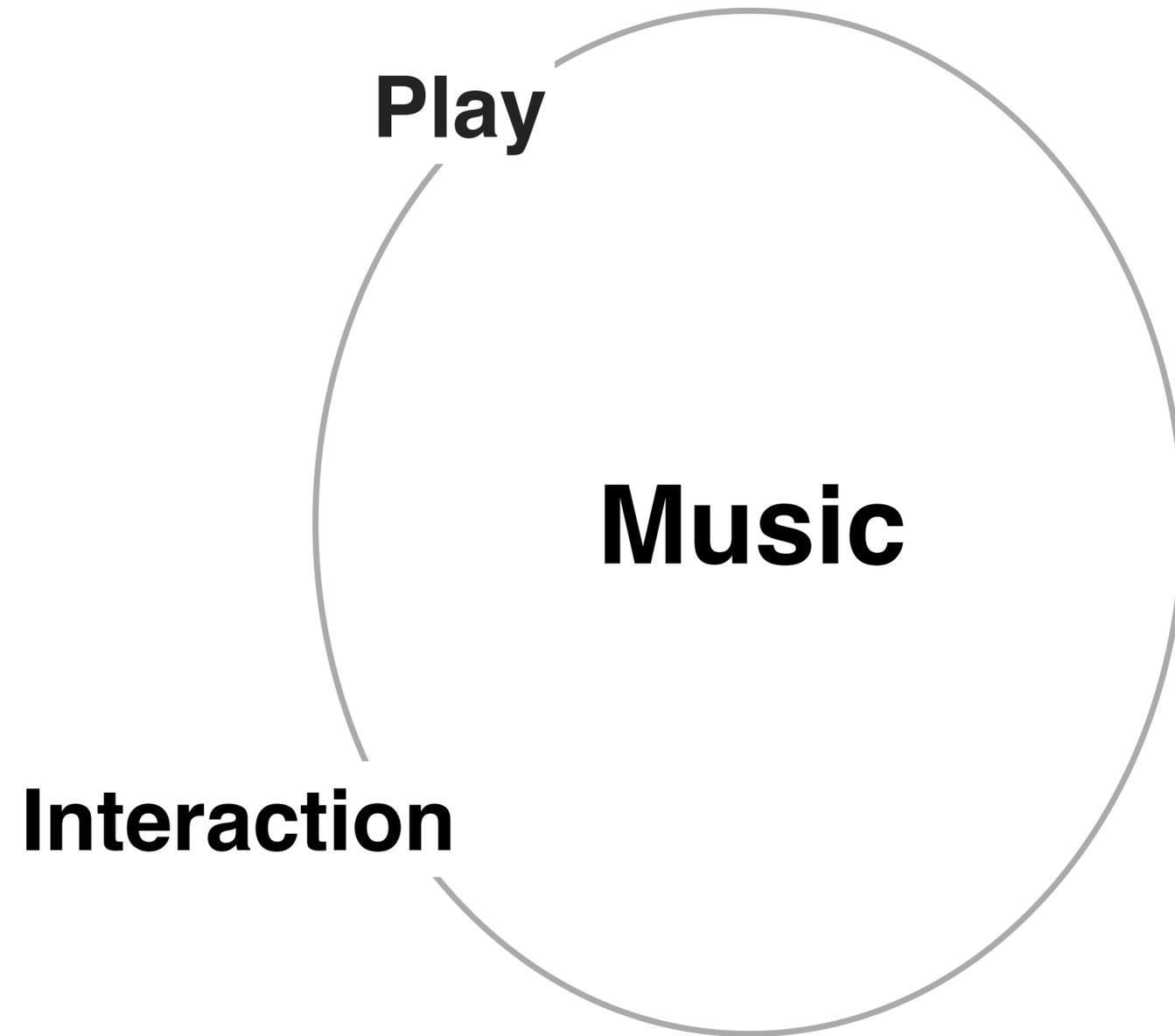


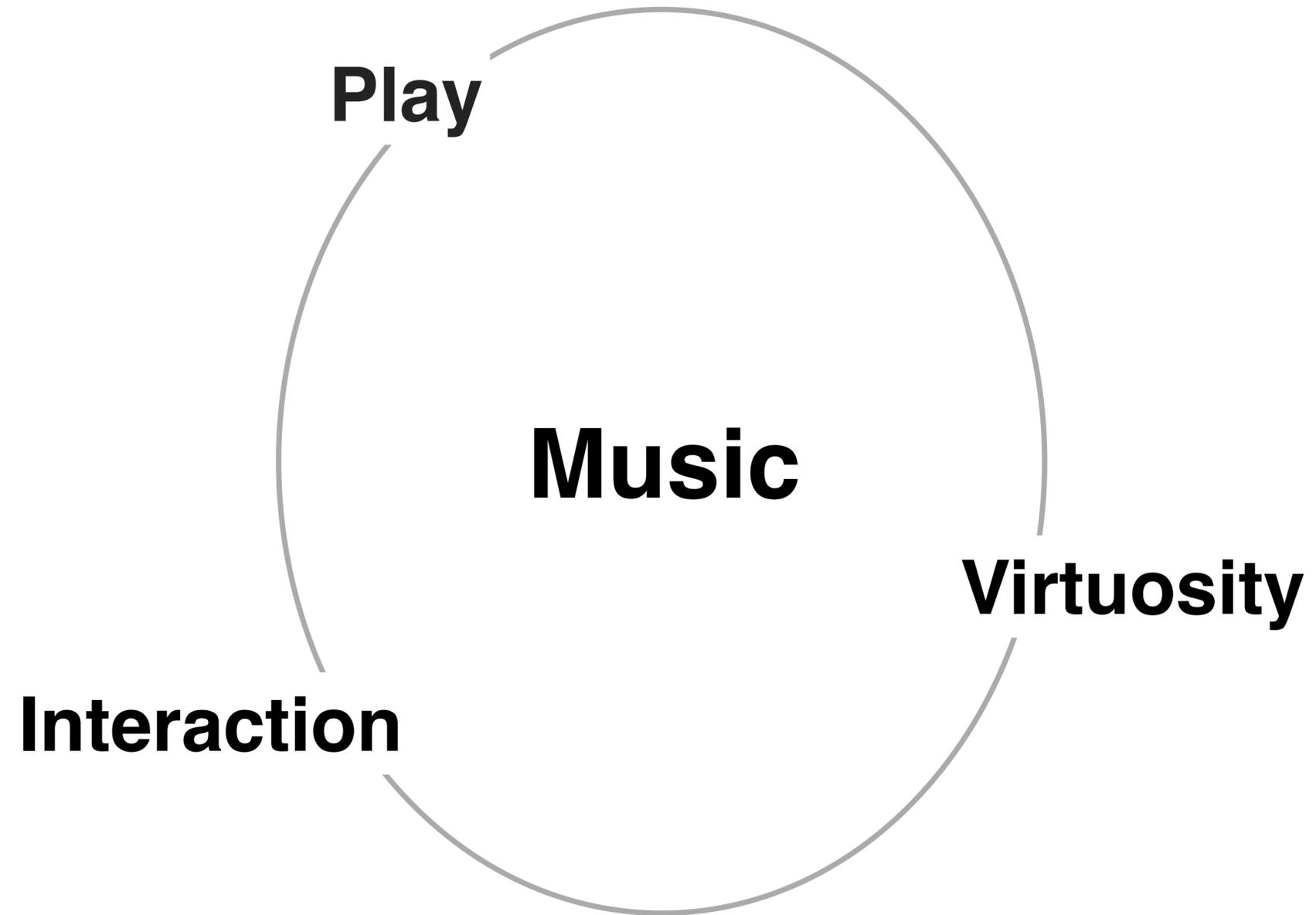
Music

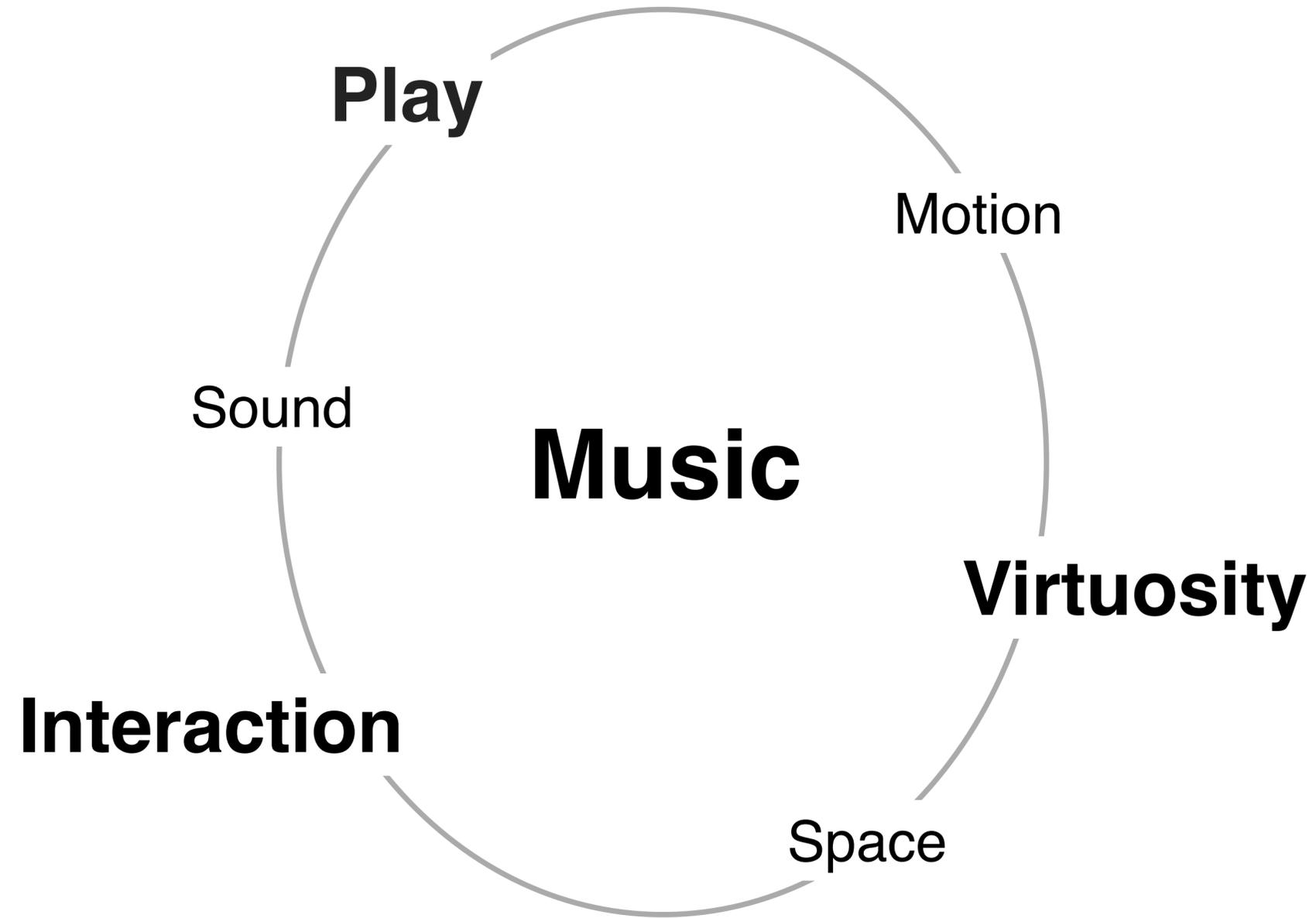


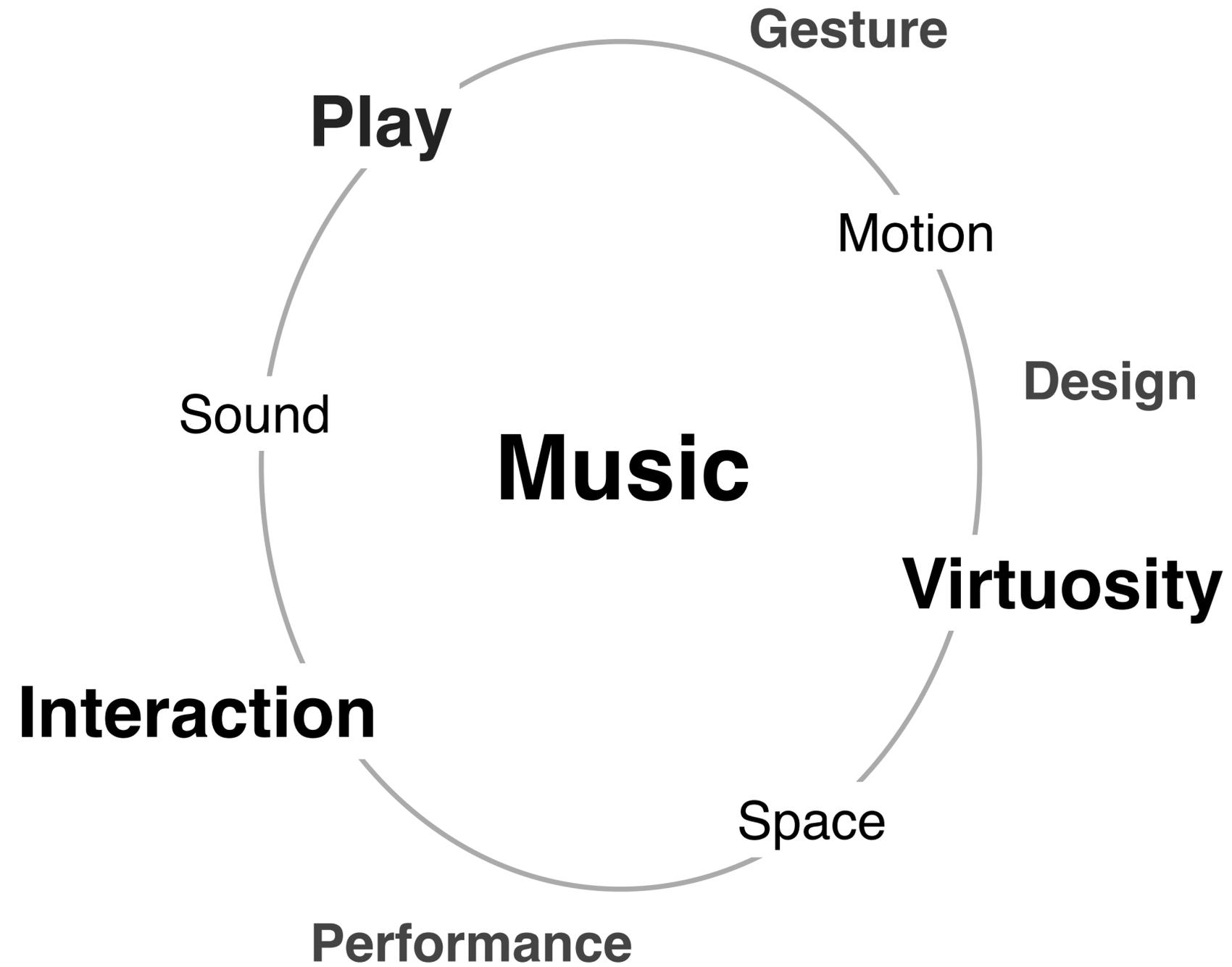
Music

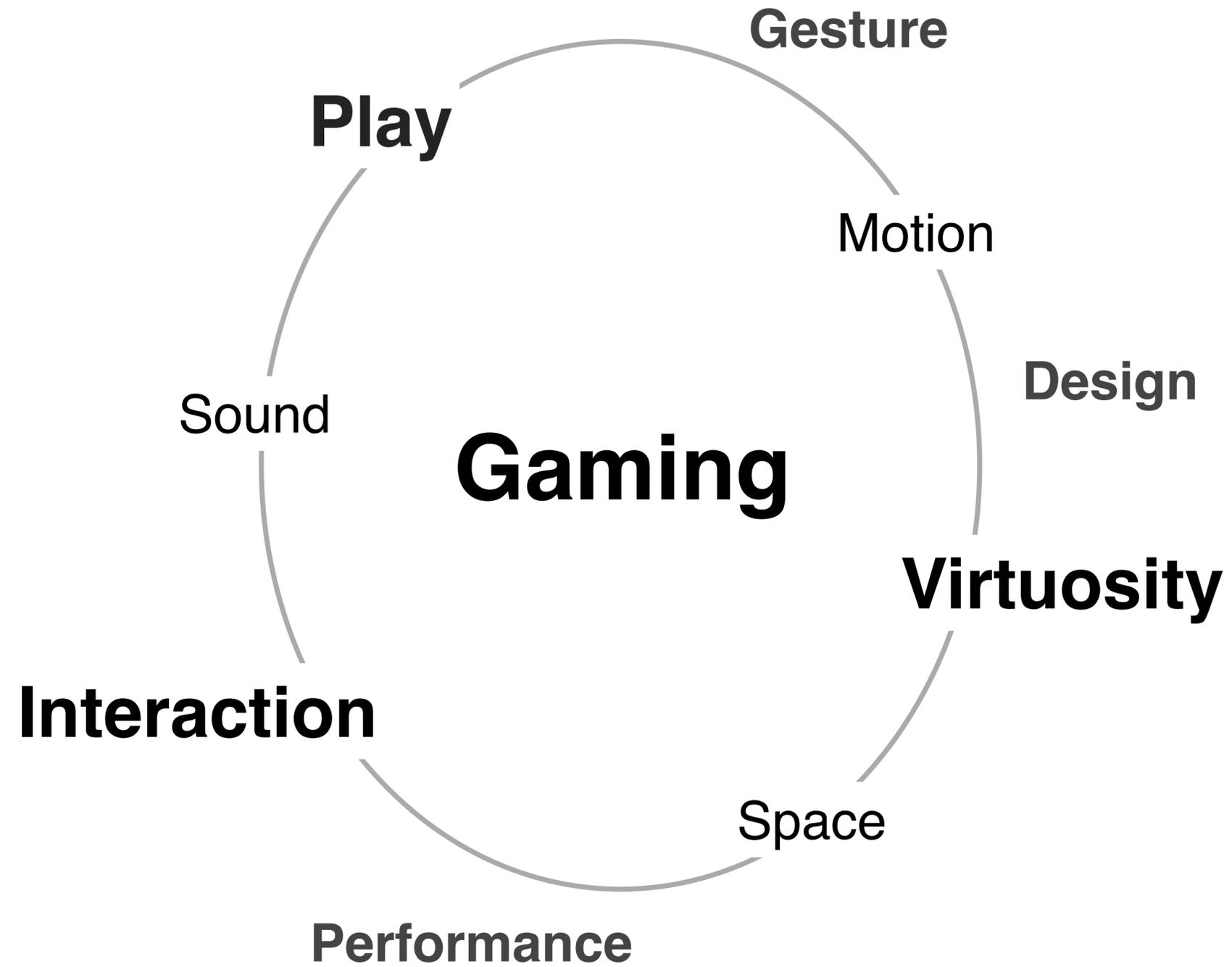


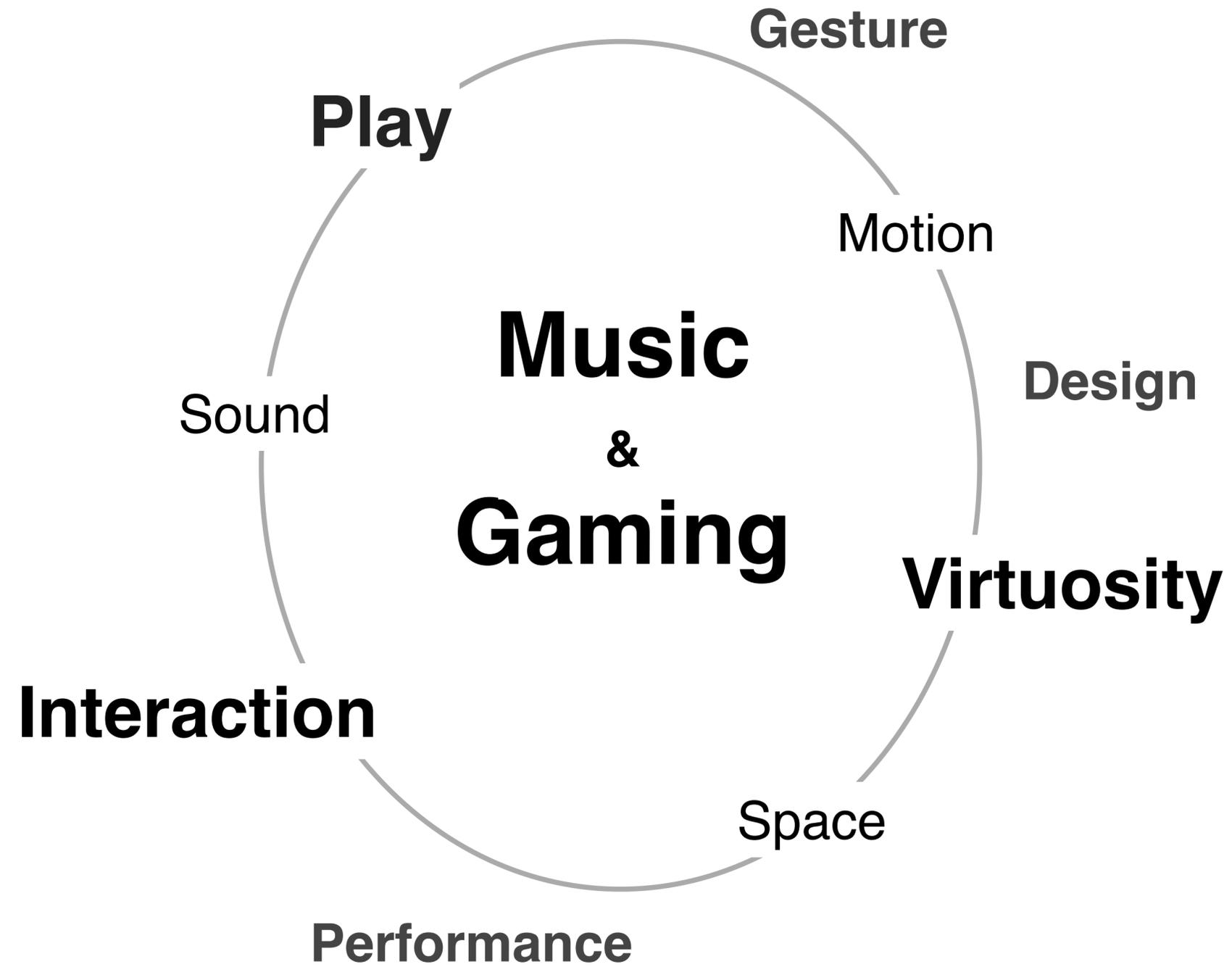












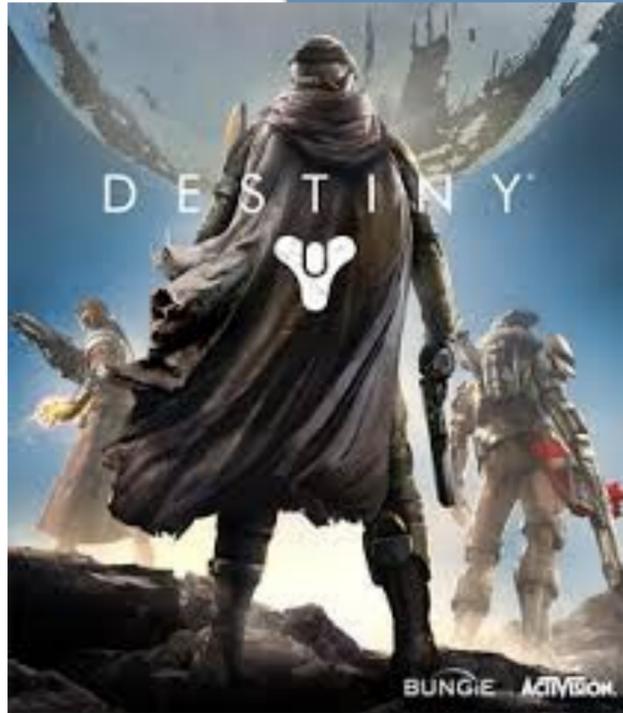
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“Game Music”



<http://www.audiogang.org/awards/2015-awards/>

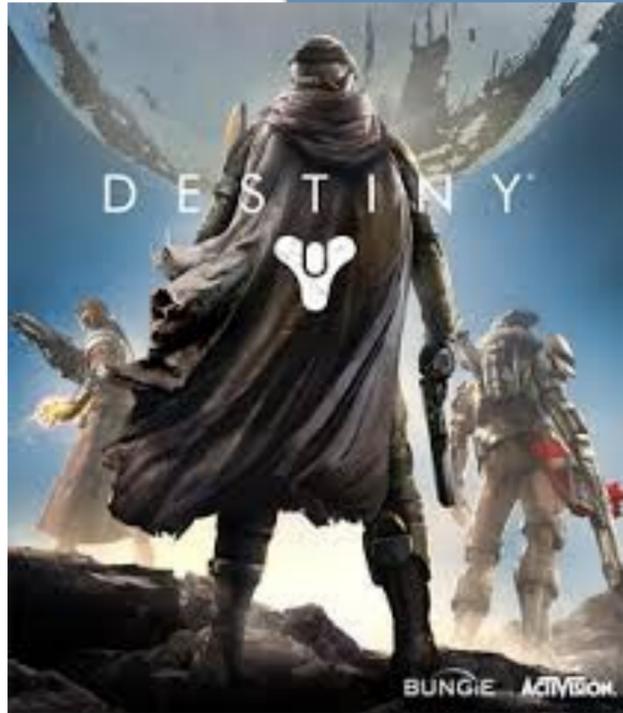


<https://www.destinythegame.com/>



by Marty O'Donnell et al.
[link ...](#)

https://www.youtube.com/watch?v=VFh5ArG46_M



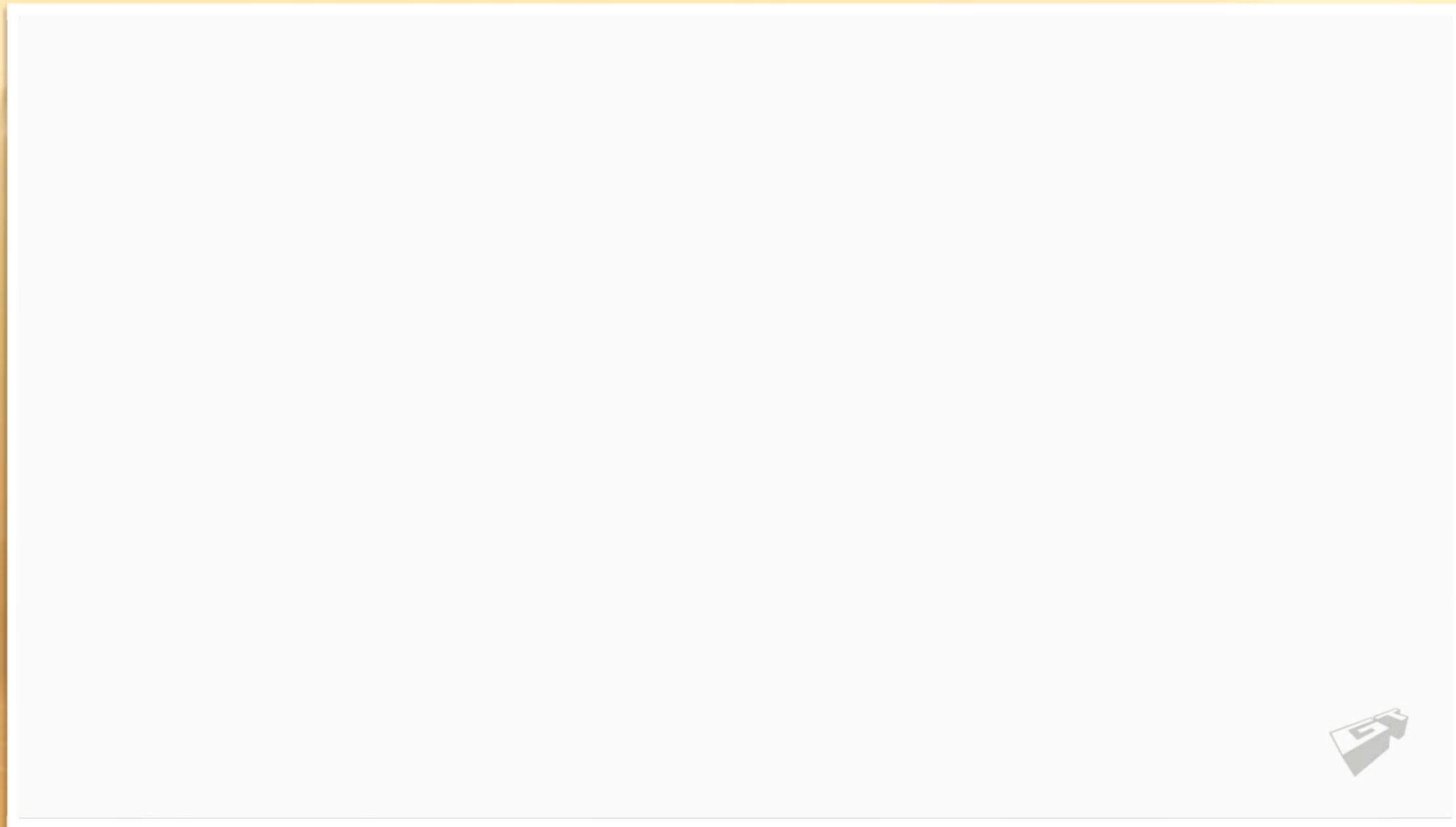
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[link ...](#)

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JOURNEY



JOURNEY

Shout 1

Shout 2

Shout 3

Shout 4



JOURNEY

Shout 1

Shout 2

Shout 3

Shout 4



JOURNEY

Shout 1

Shout 2

Shout 3

Shout 4



JOURNEY

Shout 1

Shout 2

Shout 3

Shout 4



JOURNEY

Shout 1

Shout 2

Shout 3

Shout 4



JOURNEY

Shout 1

Shout 2

Shout 3

Shout 4

Abstract Communication



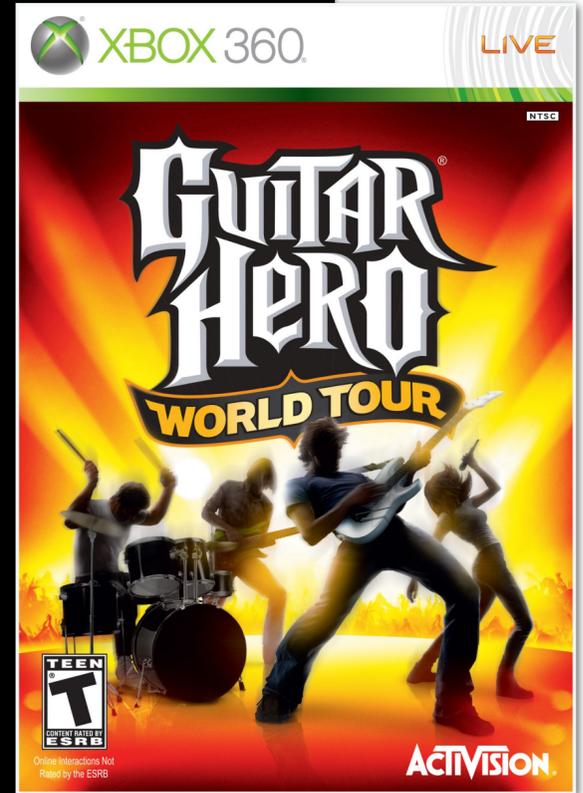


<https://www.destinythegame.com/>



by Jonathan Coulton

https://www.youtube.com/watch?v=VFh5ArG46_M





by Nickleback



by Rimsky-Korsakov, performed by Lang Lang



continuum



“background”

continuum

“performative”



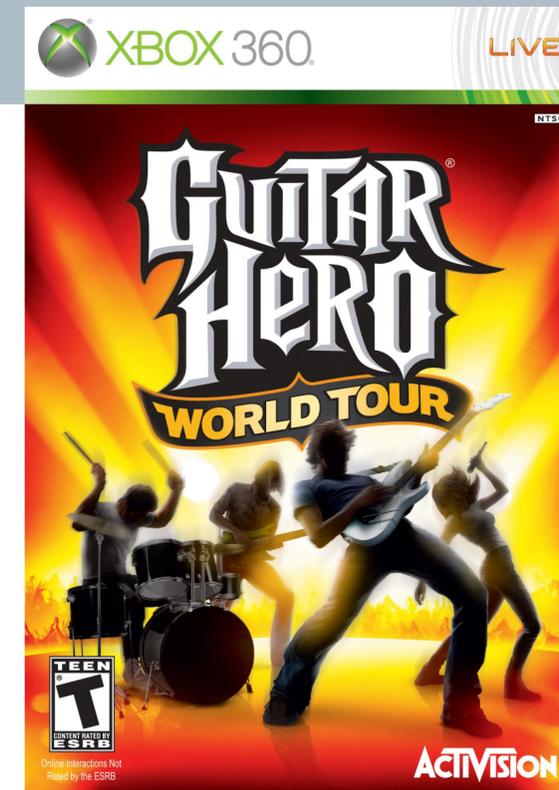
“narrative”



“performance”



“background”
or
“film-like”



“virtuosity”



+



=

?

“background”
or
“film-like”

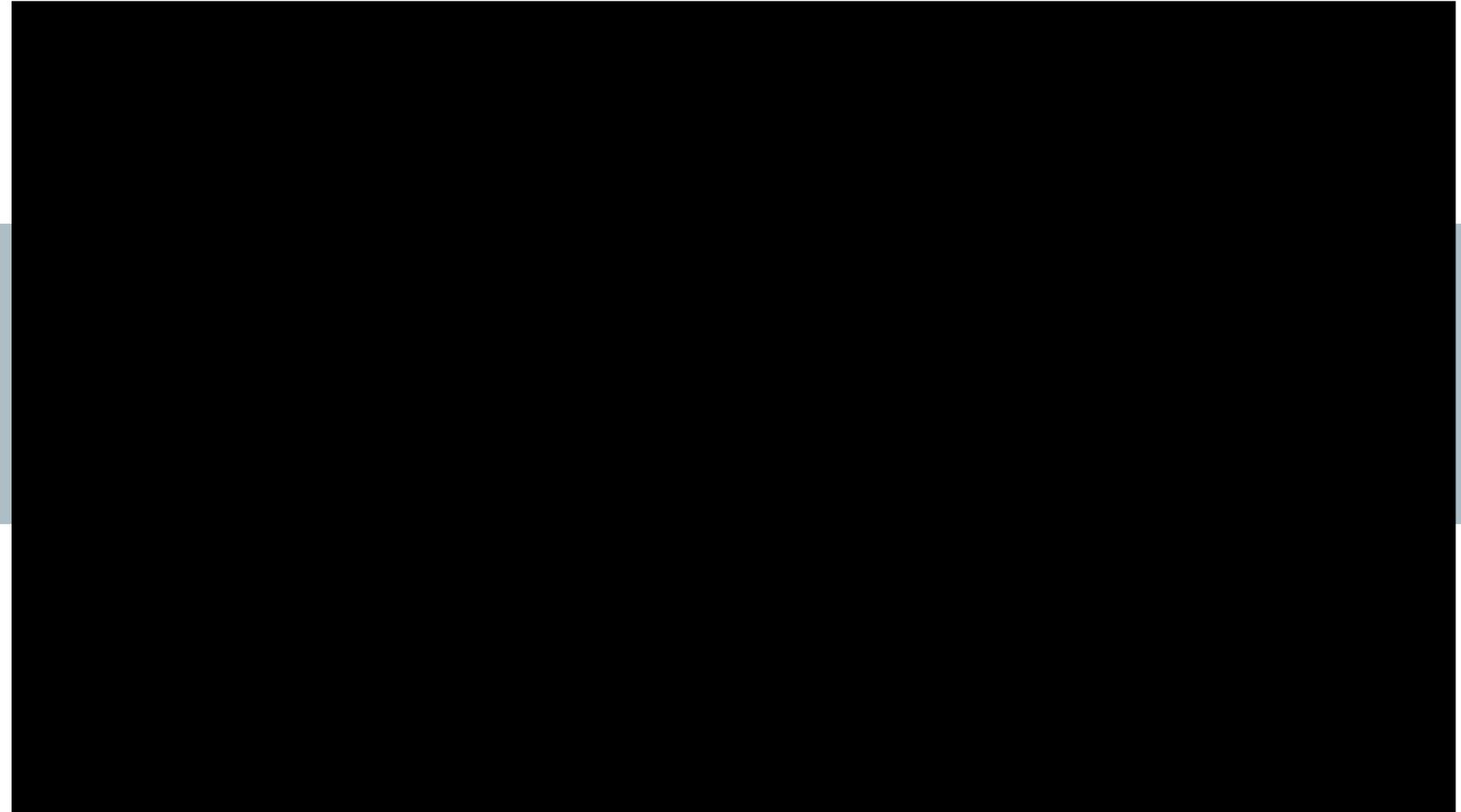
“virtuosity”



+



=



“background”
or
“film-like”

“virtuosity”

?



filmic influence

non-diegetic

continuum

diegetic



non-diegetic



Score to *Psycho*
by Bernard Herrmann

continuum



Cantina Band from *Star Wars*
by John Williams

diegetic



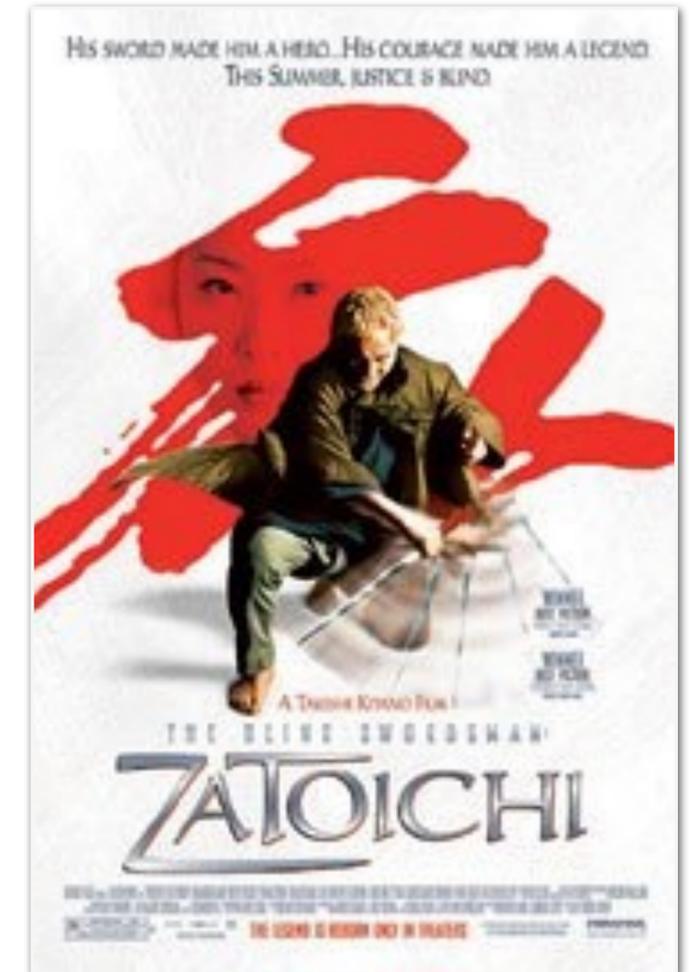
non-diegetic



diegetic

“Source Scoring”

Earle Hagan
Scoring for Films

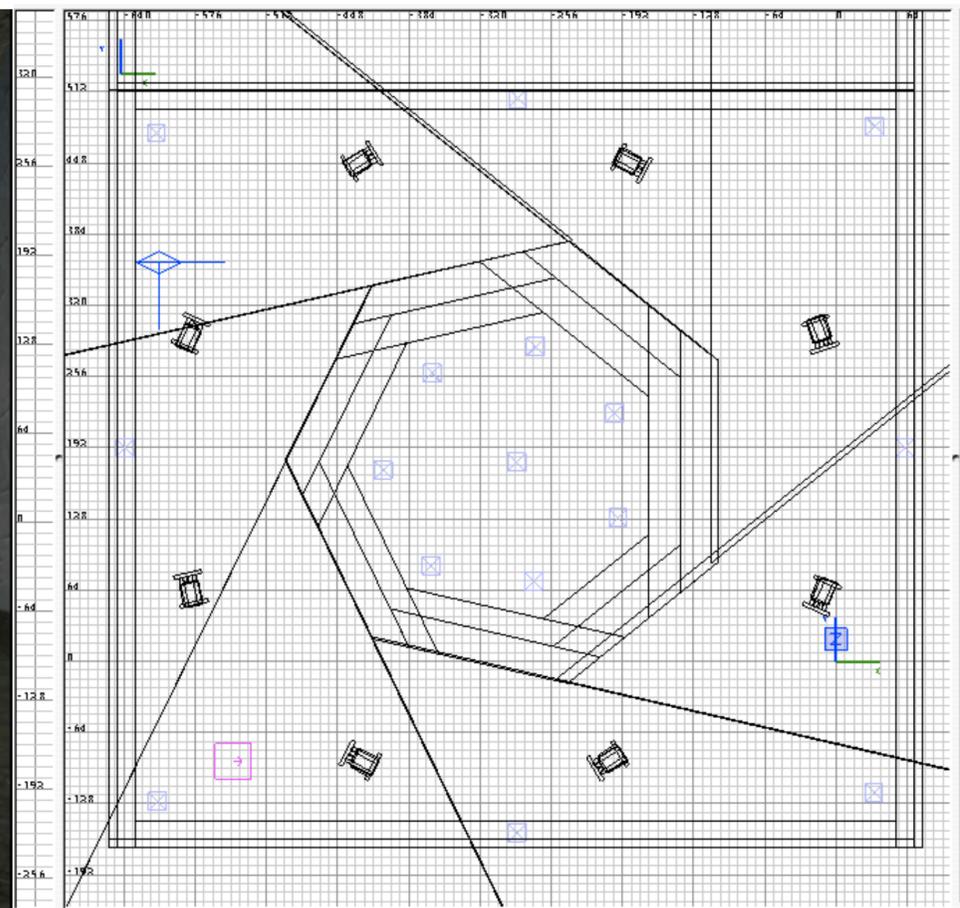
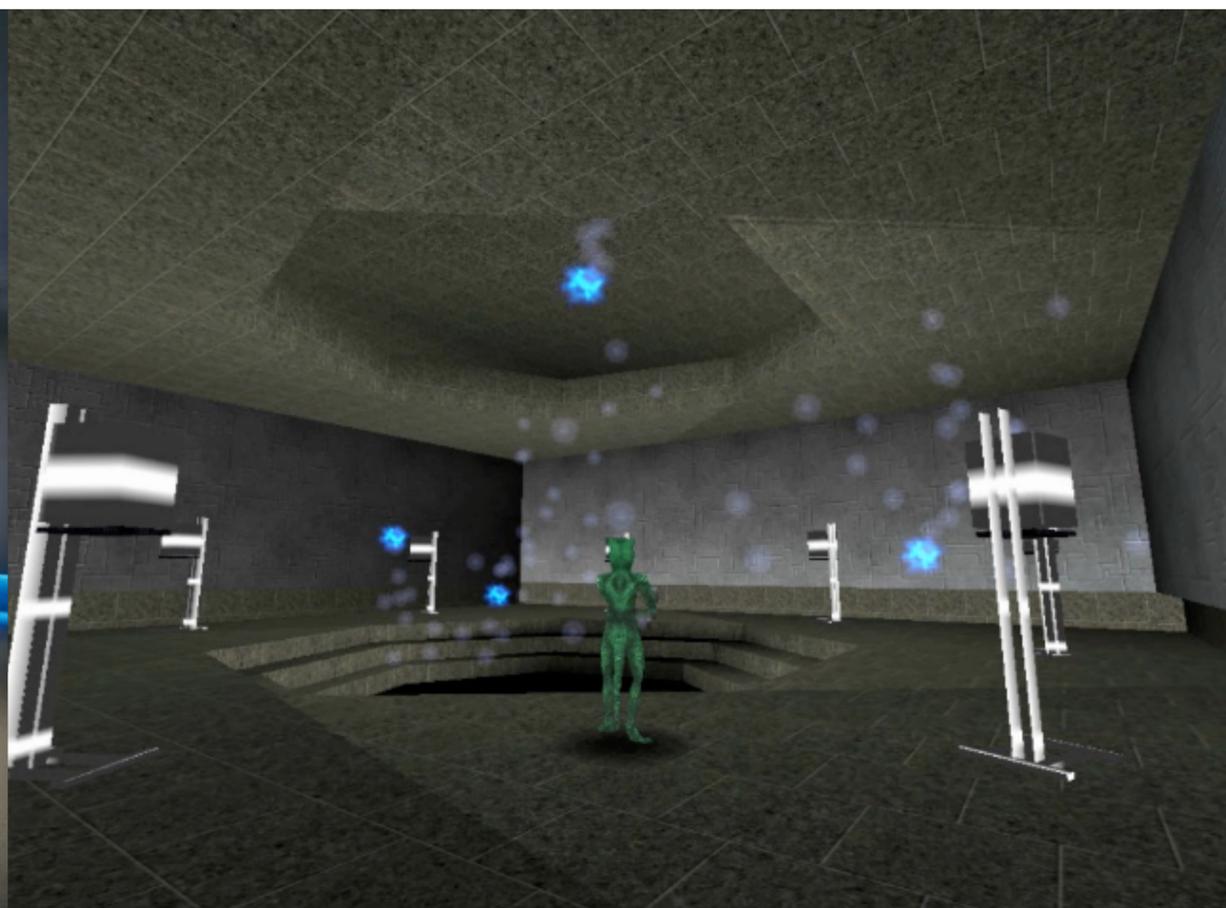


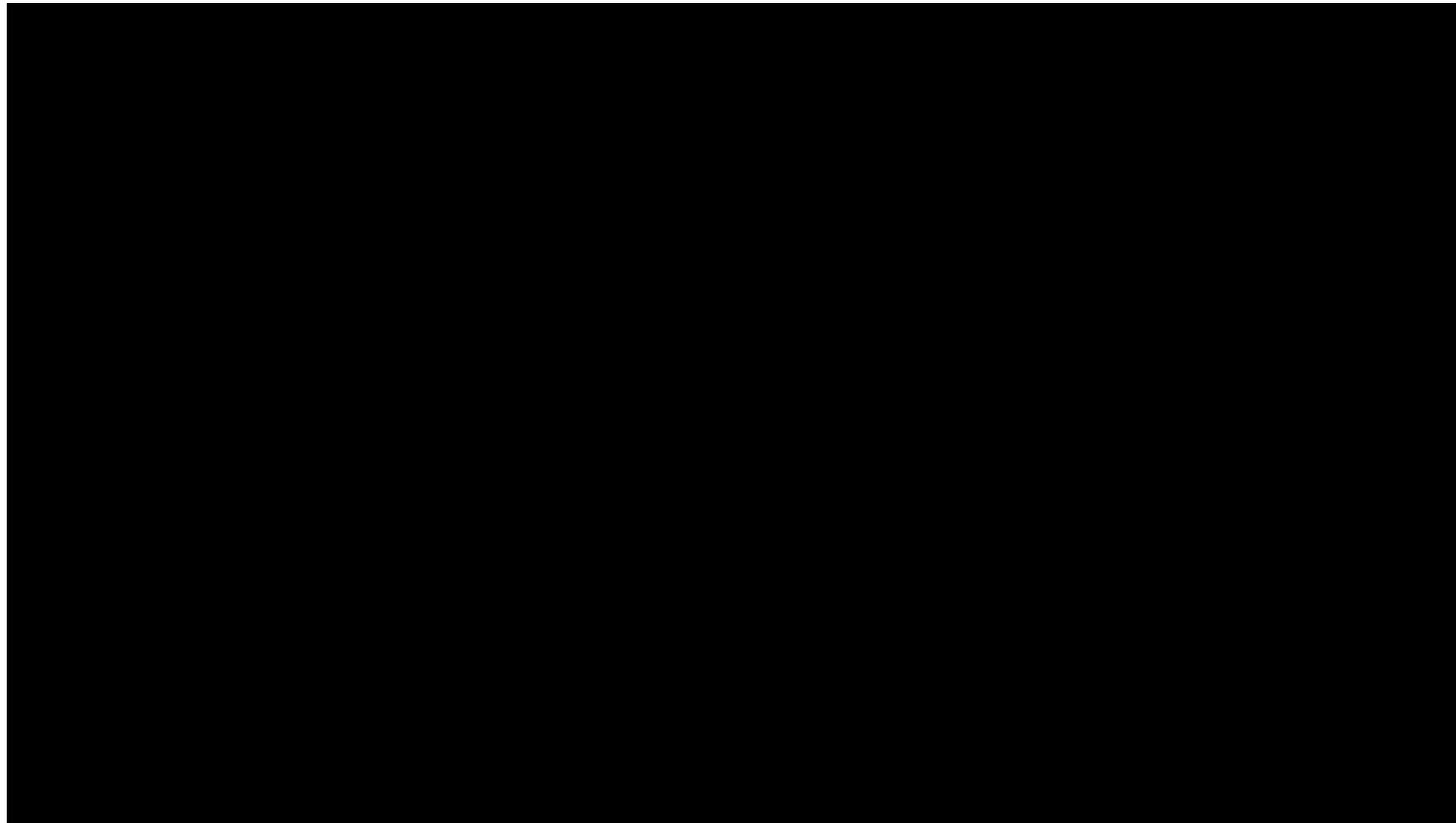
The Blind Swordsman: Zatoichi
(2003)

Keiichi Suzuki, Composer

Music in Virtual Worlds



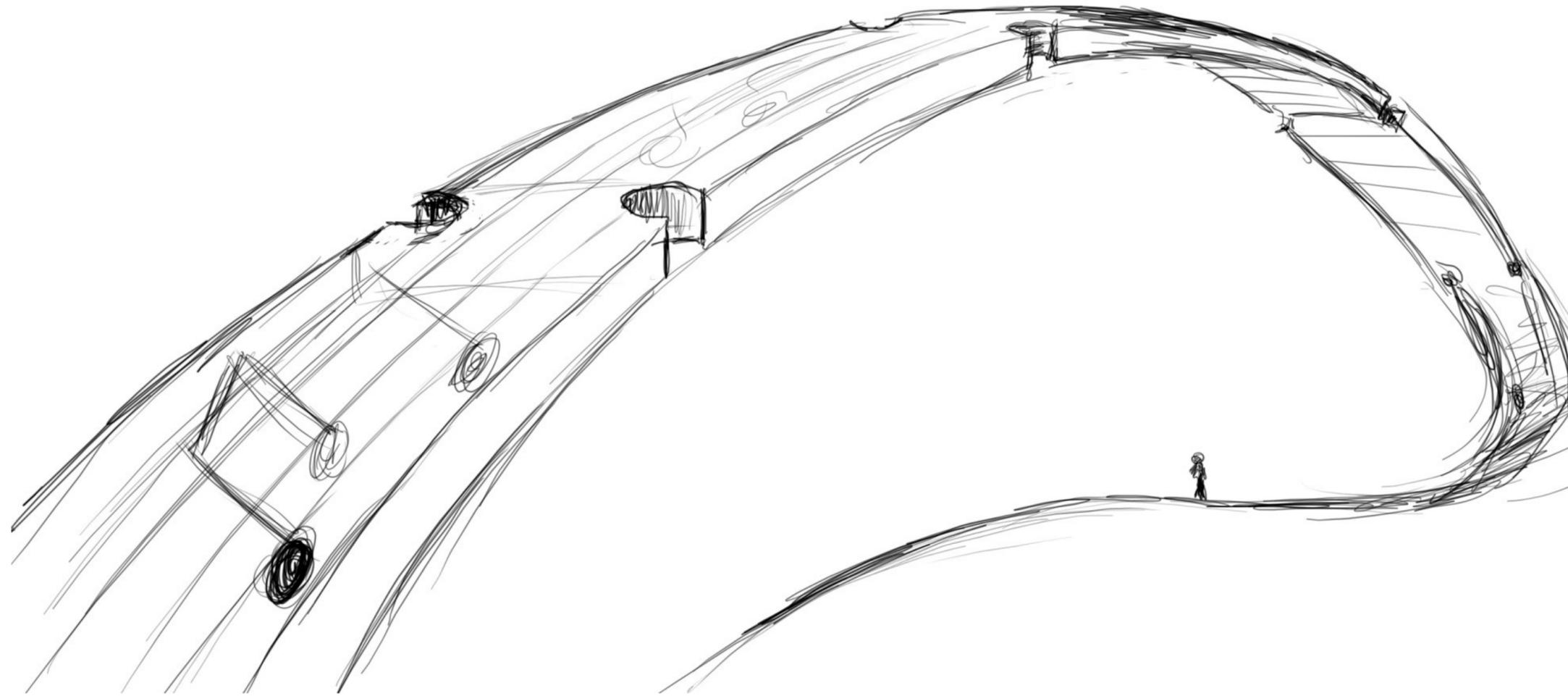




study #1 (2008)



nous sommes tous Fernando... (2008)



in C.

1. 2. 3. 4. 5. 6.
7. 8. 9. 10.
11. 12. 13. 14. 15.
16. 17. 18. 19. 20. 21.

The image shows the first 21 measures of the musical score for 'In C' by Terry Riley. The music is written in treble clef and common time (C). It consists of a single melodic line with various rhythmic patterns, including eighth and sixteenth notes, rests, and some accidentals like a sharp and a flat. The measures are numbered 1 through 21.

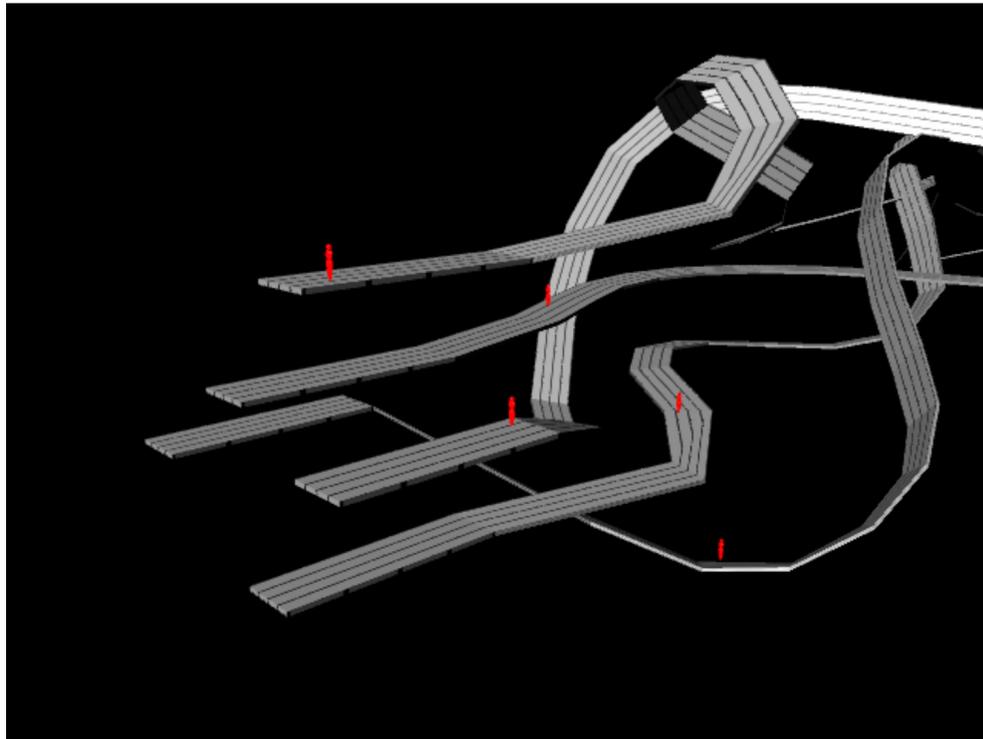
From Riley's Performance Instructions:

“One of the joys of *In C* is the interaction of the players in polyrhythmic combinations that spontaneously arise between patterns.”

36. 37. 38. 39. 40. 41. 42.
43. 44. 45. 46. 47.
48. 49. 50. 51. 52. 53.

© 1964
Terry Riley
© 1989
Celestial Harmonies

The image shows measures 36 through 53 of the musical score for 'In C'. The notation continues with various rhythmic patterns and melodic lines. The measures are numbered 36 through 53. In the bottom right corner, there is a copyright notice: © 1964 Terry Riley © 1989 Celestial Harmonies.





SettembreMusica

Torino Milano
Festival Internazionale
della Musica

03_24.IX.2009
Terza edizione

Milano / 12.IX 2009 saturday, at 10:00 pm



AVANT-GARDE

Politecnico Sede di Milano Bovisa
Aula De Carli

Mixed Reality Performance: An Evening on Sirikata

A project commissioned by the
MITO SettembreMusica Festival

Terry Riley

In C, for Laptop Orchestra and Acoustic Instruments

Juan-Pablo Caceres, Robert Hamilton

*Canned Bits Mechanics, for Three Remote Disklaviers at
CCRMA, a Piano and Visualizations in Sirikata*

Robert Hamilton, Juan-Pablo Caceres

Of Two Worlds, for Interactive Sirikata Performers

Dialogues, Networked Improvisations

With the participation of

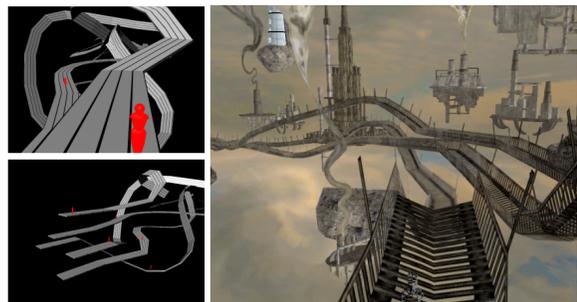
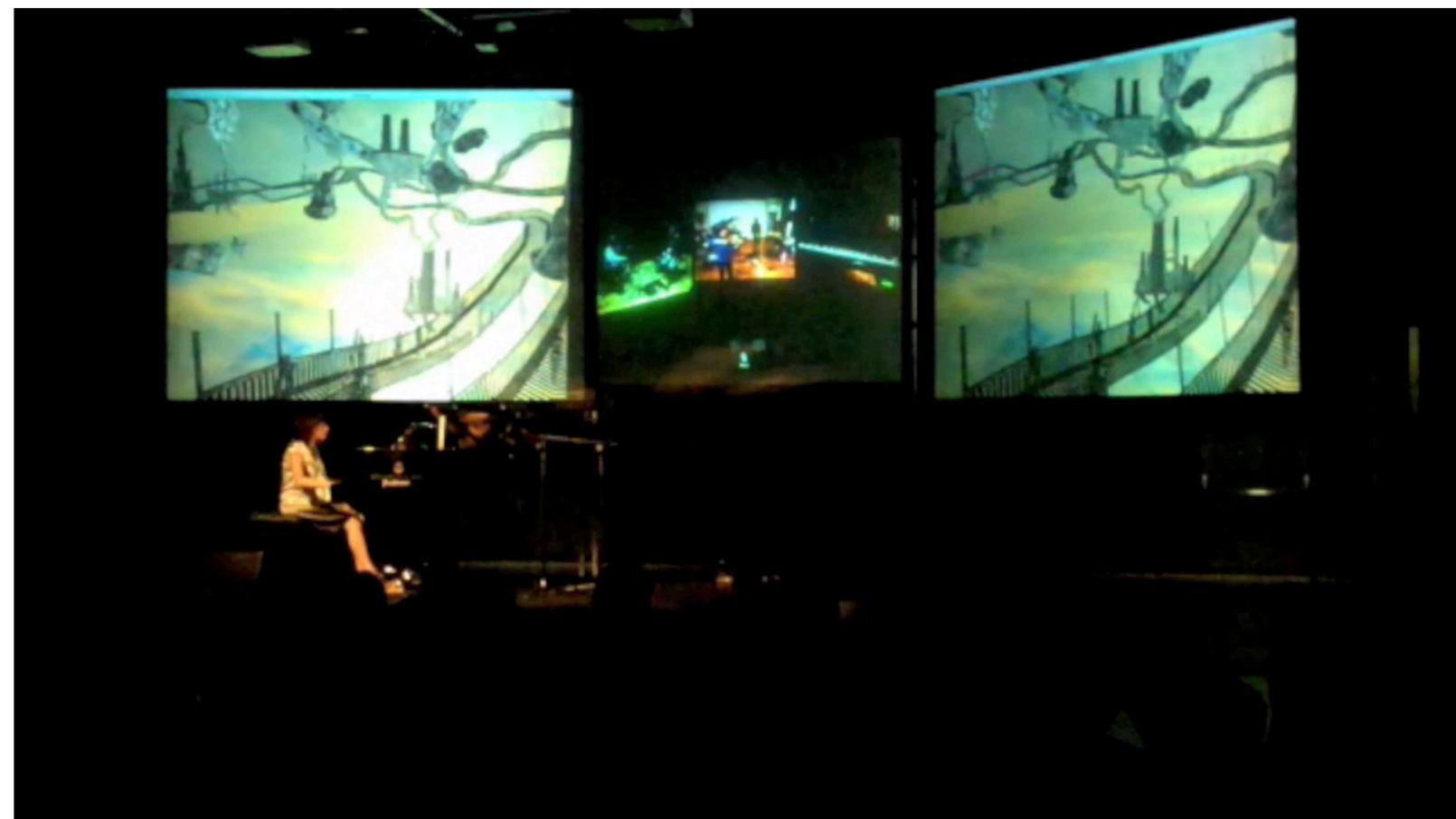
Jeffrey T. Schnapp,
founder-director, Stanford Humanities Lab

Juan-Pablo Caceres,

Robert Hamilton,

Chryssie Nanou,

Center for Computer Research in Music and Acoustics



MIO
MIO

SettembreMusica

Torino Milano
Festival Internazionale
della Musica

03_24 settembre 2010
Quarta edizione

AVANGUARDIA

Politecnico Sede di Milano Bovisa
Aula De Carli

Play your phone!

Performance-concerto interattivo per esecutori e pubblico

Chris Chafe

Siren Coud, per pianoforte, chitarra elettrica e pubblico

Robert Hamilton

Tale-Harmonium, per pianoforte e esecutori virtuali

Jieun Oh, Robert Hamilton

Dichotomous Harmonies, per tromboni analogici e sintetizzati

Juan-Pablo Caceres

Perkussionista, per pianoforte, percussioni virtuali e disklavier

Luke Dahl, Jorge Herrera, Carr Wilkerson, Robert Hamilton

Tweet, per pubblico, Twitter e iPad controllers

Chryssie Nanou, pianoforte

Robert Hamilton, chitarra, elettronica

Juan-Pablo Caceres,

Luke Dahl,

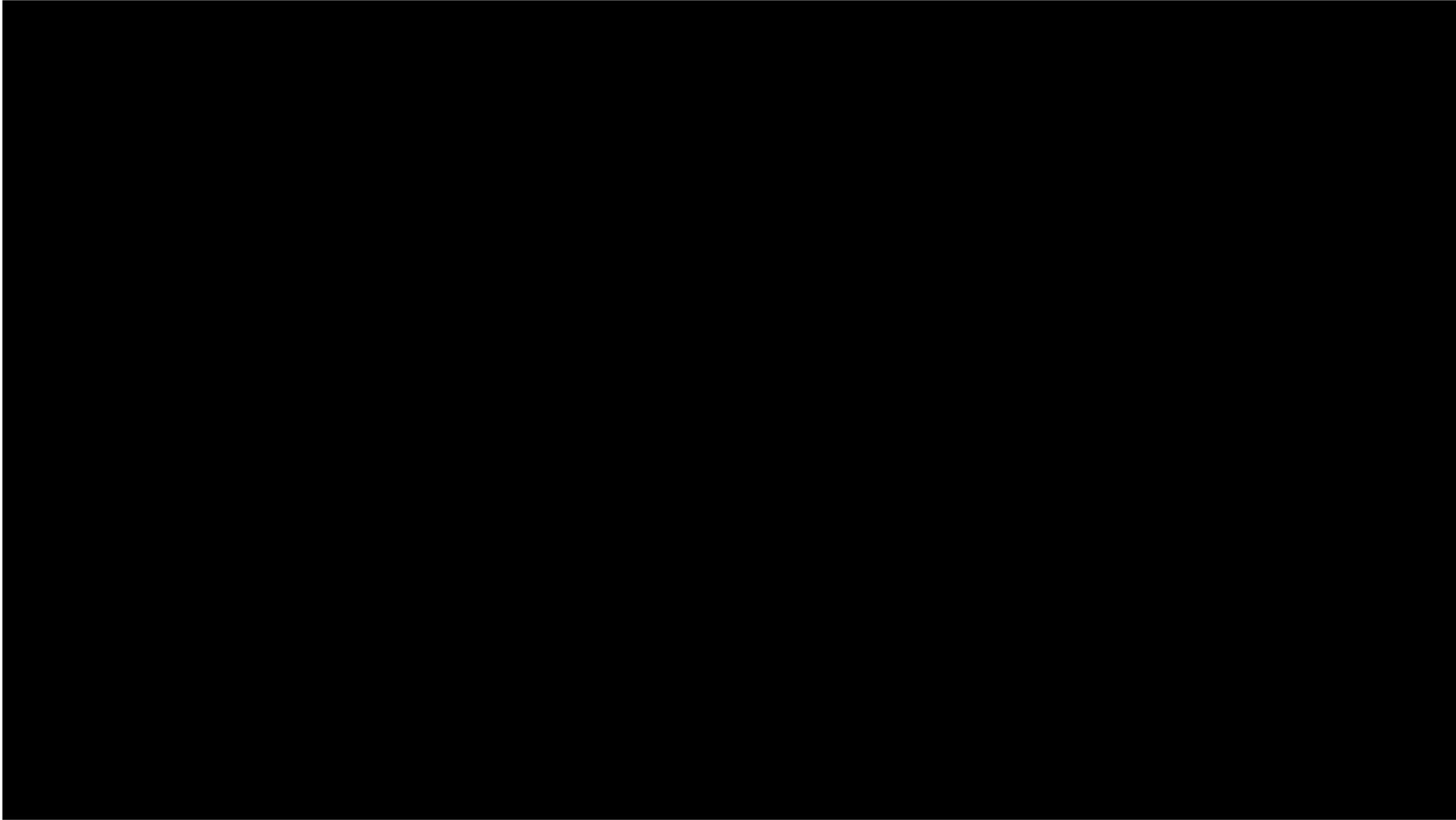
Jorge Herrera, elettronica



Tele-Harmonium
for piano and virtual performer



In collaborazione con
Stanford Humanities Lab
Center for Computer Research in Music and
Acoustics, Stanford University
Politecnico di Milano
Social media dissemination a cura di [2lifeCast](#)



ECHO::Canyon





MINECRAFT + OSC

OSCCraft

<https://github.com/robertkhamilton/osccraft>

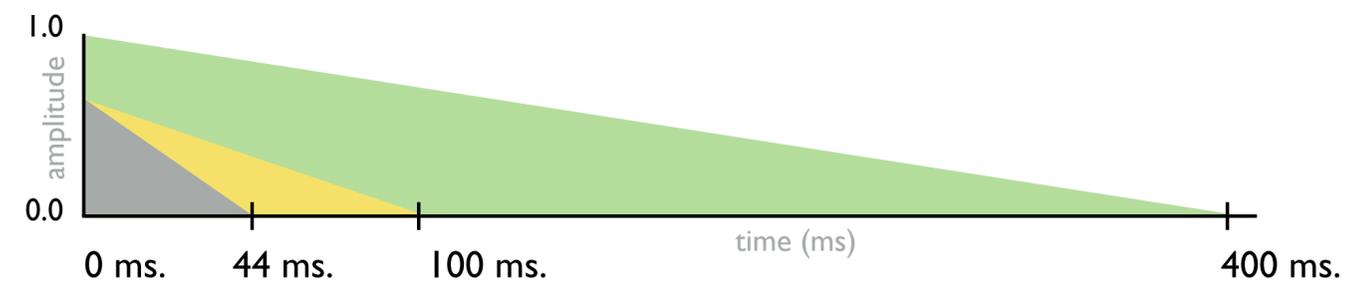
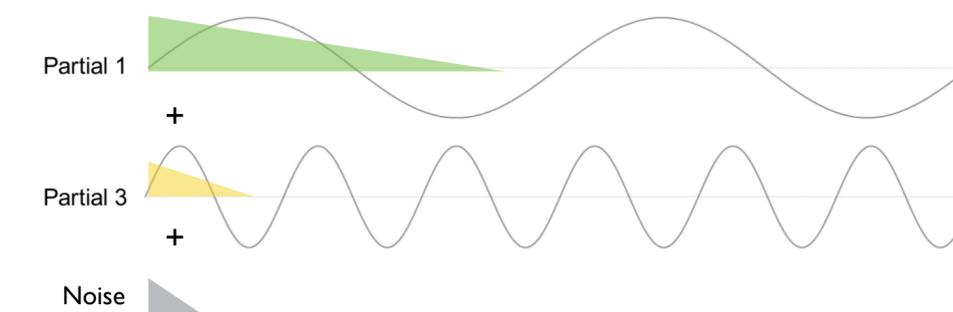
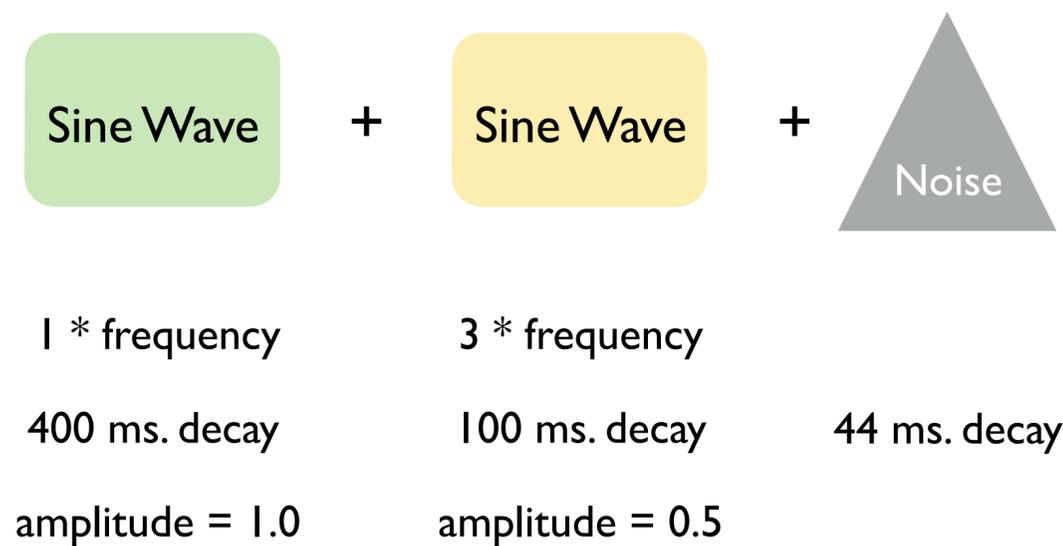


MINECRAFT + OSC

<https://github.com/robertkhamilton/osccraft>

OSCCraft

Additive Synthesis: "Marimba"



OSCCraft

tutorials.pd

Edit anything in this patch by "unlocking" the patch with command-E (OS X) or Edit > Edit Mode in the Pd menu

pd how-to-get-help

Turn DSP on or off with simple text messages

pd dsp 1 pd dsp 0

ON OFF

Introduction to PD

- pd printing
- pd inlets-and-outlets
- pd subpatches-vs-abstractions
- pd osc-with-volume
- pd ramp-volumes
- pd notes-and-envelopes
- pd sends-and-receives
- pd midi-pitches
- pd chord
- pd keyboard-input

Open Sound Control

- pd osc-input
- pd osc-send
- pd osc-input-vanilla
- pd osc-send-vanilla
- pd unity-receive-osc

Scale data range example

- pd maprange

Basic Synthesis Examples

- pd additive-synthesis
- pd sine-wave-oscillator
- pd sawtooth-oscillator
- pd square-oscillator
- pd am-synthesis
- pd tremolo
- pd ring-modulation
- pd fm-synthesis
- pd sequences
- pd reverb
- pd delay

"Horrible" Instruments

- pd file-playback-scratcher
- pd drums-horrible-snare
- pd drums-horrible-kick
- pd horrible-marimba
- pd cleaner-horrible-marimba

"Guitar" String model

- pd karplus_strong

Risset "Bells" model

- pd bells

comment

OSCCraft pd osccraft

Grey Wastes (Unity) pd greywastes pd wind_bp

Proceede Engine pd proceede-engine
(generative/probabalistic tool)

Unreal OSC messages sent to this abstraction

pd unreal-receive-osc.....

pd wind

Leap-motion

Distance to cube driving additive synthesis

pd additive-synthesis-2

pitch_2

inlet inlet inlet

osc~

1, 0 400

line~

- 61

*~ 0.33

*~ 0.4

*~ 0.4

outlet~



Grey Wastes

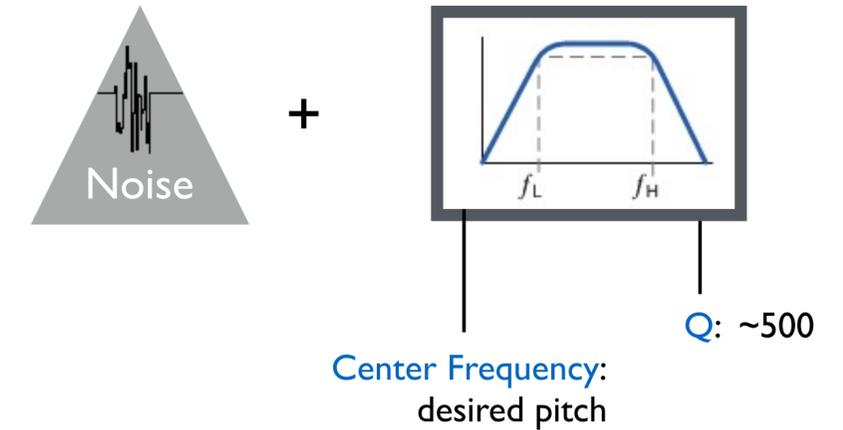


Grey Wastes

 **unity** + libPD + iOS

Grey Wastes

“Wind” element



- Higher Q value narrows the frequency range
- Lower Q value makes it more noisy
- Center Frequency driven by player's **Height**

Stochastic Compositional Elements

Generative rhythmic and melodic elements

- Speed of motion gates output
- Percussion inflection **randomized** within constraints

Analysis-based Compositional Elements

- Analyze musical scores
- Drive with game parameters

1) Load a JSON score into memory

```
file load /demo/proceede/bach_chorale.json
```

2) Build probability models

```
markov load
```

3) Request a note from voices 1-4

```
1 2 3 4
```

```
markov next 1 $1 1
```

```
proceede
```

```
pd play note
```

```
dac~
```



Grey Wastes

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pd wind

Leap-motion control

pd additive-synthesis-2

Distance to cube driving additive synthesis example

wind_bp

```
graph TD
    noise[noise~] --> amp_in[inlet amplitude (0 - 1)]
    amp_in --> mul1[*~]
    mul1 --> freq_in[inlet Center Frequency]
    freq_in --> bp[bp~ 440 80]
    bp --> mul2[*~ 2]
    mul2 --> out1[outlet~]
    mul2 --> out2[outlet~]
```



Virtuality & Gesture



Virtuality & Gesture

CARILLON

